

Koch, Kristine

From: Jeremy_Buck@fws.gov
Sent: Monday, August 05, 2013 5:00 PM
To: PETERSON Jenn L; Shephard, Burt
Subject: RE: PCB SLVs, ATLs, TRVs - and another possible RSET use for this spreadsheet?
Attachments: PCB_126 and 77 SLVs.xls

Agreed. But as you know, the whole TEQ in sediment thing drives FWS folks nuts. The TEQ value in sediment is not likely related to the TEQ in fish or invert tissue due to different uptake rates of chemicals, absence of the Ah receptors in some biota, interspecific differences in the Ah receptor, and other nice things. So there really would be no good relation expected between sediment and biota. At best it seems a sediment TEQ could be used as an index to compare sediment from one location to another, but to say a sediment TEQ value would or would not be harmful to an organism would be really pushing it. I think it's best to take the actual concentrations for the individual PCBs of most concern and model the concentrations up and down, then use a TEFs on tissue values after the modeling if needed, and regulate on a sediment concentration rather than a TEQ. But I'm sure you already went over this with your PM and we'll be doing TEQs anyway.

Hoffman et al. 1998 reports "Combined data of Kubiak et al. [22], Brunstrom et al. [23], Smith et al. [24], and Hoffman et al. [6,18,25] suggests that three PCB congeners (126, 77 and 105) may account for over 90% of the PCB toxicity in eggs of birds, including Forster's tern, in the Great Lakes." Those are pretty much the main 3 we have seen as well in the Columbia driving overall toxicity (in addition to TCDD) in biota, and I think they are the main ones in the Willamette samples as well (with exception of TCDD) but I haven't checked the fish recently.

I attached a spreadsheet estimating SLVs for PCB 77 and 126, based on Egg TRVs reported (for the species listed in the spreadsheet) from EPA 2003 for each congener, and their specific BMFs from the Henny osprey/fish study. I used a 4 BSAF, but that could be changed to a number more specific to each congener, as Jen indicated. I suppose the spreadsheet could be used to calculate TEQs in sediment as well, if one is forced to do so, with assumptions and limitations listed boldly around the resulting SLV. Getting egg TRVs or dietary TRVs for other congeners could be a bit problematic.

From: PETERSON Jenn L [mailto:PETERSON.Jenn@deg.state.or.us]
Sent: Monday, August 05, 2013 8:58 AM
To: 'Shephard, Burt'; Jeremy_Buck@fws.gov
Subject: RE: PCB SLVs, ATLs, TRVs - and another possible RSET use for this spreadsheet?

Yes, if you think PCB 77 is driver of PCB TEQ risk. You have to make sure that the TEF conversion and the BSAF which may be different depending on the congener is appropriately considered. I have used a correction factor in the past to go from a single congener to represent total TEQ. The alternative would be to adjust the TRV (I am assuming this is for 2,3,7,8-TCDD) by the TEF for each congener and come up with congener specific sediment "PRGs" in sediment. Of course, this could be limited to the two drivers (77 and 126). If you are using the same BSAF for each congener this would be an easy way to go. A BSAF of 4 may be o.k. for total PCBs but I have used different BSAFs for the different congeners to represent different chemical properties (e.g. greater than 4) – esp. for PCB 126. If I recall, PCB 126 was the driver of avian TEQ in the harbor but 77 was a close second.

Sounds like you are still having fun with this stuff!

Jennifer

From: Shephard, Burt [mailto:Shephard.Burt@epa.gov]
Sent: Friday, August 02, 2013 1:39 PM

To: Jeremy_Buck@fws.gov

Cc: PETERSON Jenn L

Subject: RE: PCB SLVs, ATLS, TRVs - and another possible RSET use for this spreadsheet?

Thanks again, Jeremy.

The additional use thought I had was this. If you exchanged the dietary total PCB TRV for a congener specific TRV, such as the PCB 77 TRV of 0.00014 mg/kg BW/day (the PCB dioxin-like TEQ dietary TRV for birds) and kept everything else the same (body weight, diet, BSAF, BMF, etc.), you would have a spreadsheet that would calculate PCB TEQ in sediment, using sediment PCB 77 concentration as the surrogate compound for the PCB TEQ, wouldn't you? The spreadsheet wouldn't contain any of the supporting literature that is the basis for the PCB TEQ, but the math should work for dietary exposure.

Best regards,

Burt Shephard
Risk Evaluation Unit
Office of Environmental Assessment (OEA-095)
U.S. Environmental Protection Agency, Region 10
1200 6th Avenue
Seattle, WA 98101

Telephone: (206) 553-6359

Fax: (206) 553-0119

e-mail: Shephard.Burt@epa.gov

"Facts are stubborn things"

- John Adams

From: Jeremy Buck [mailto:jeremy_buck@fws.gov]

Sent: Thursday, August 01, 2013 6:12 PM

To: Shephard, Burt

Cc: peterson.jennifer@deq.state.or.us

Subject: PCB SLVs, ATLS, TRVs

Hi Burt-

I attached the egg and dietary approach values for PCBs which I just finished. It is more drafty, and I need to double check a few things, but I think the equations and results are pretty good to go. The kingfisher SLV matches up with the PRG for sediment that you mentioned (30 ug/kg) pretty well (I can't remember what you said the 30 was based on ...human health?). Anyway, the results are a good check on the PCB values you are using to see where they fall in line with the Eco values. I didn't find many other papers where I could glean TRVs and NOAELs from for wildlife, other than what LWG identified, and I would like to take some more time to do so as I think there are some values for cormorants or tree swallows by now. Right now the values are based on chicken parameters and I would rather use a wildlife species, so I may work on it a little more as I develop it for use by RSET. Thanks -Jeremy